



# ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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## Project Summary

Construction Permit Application  
University of Illinois at Urbana-Champaign (UIUC)  
Abbott Power Plant  
Champaign, Illinois

Facility Identification No.: 019010ADA  
Application No.: 13120041  
Date Initially Received: December 30, 2013

### Schedule

Additional Public Comment Period Begins: November 13, 2014  
Additional Public Comment Period Closes: December 13, 2014

### Illinois EPA Contacts

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## **I. INTRODUCTION**

The University of Illinois at Urbana-Champaign (UIUC) has applied for an air pollution control construction permit for three new boilers at its existing central steam plant located southwest of the main campus. The new boilers would be fired on natural gas and oil. The new boilers would replace three existing boilers.

The Illinois EPA has reviewed UIUC's application and made a preliminary determination that the application for the proposed project meets applicable requirements.

The Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the proposed boilers. Prior to issuing any permit, the Illinois EPA is holding a public comment period to receive comments on this proposed action and the terms and conditions of the draft permit.

## **II. PROJECT DESCRIPTION**

The new boilers would be located at UIUC's existing steam plant, the Abbott Power Plant. This plant supplies steam to the campus as well as generates some of the electricity used by the campus. The three new boilers would combust natural gas and fuel oil to supply steam to the university campus, as well as to generate electricity. The primary fuel would be natural gas and distillate fuel oil would be a backup fuel to address possible interruptions and curtailments in the supply of natural gas.

The three boilers would be constructed in phases. In phase one, two existing natural gas/oil-fired boilers would be dismantled and removed and the first new boiler would be constructed. In phase 2, the third existing boiler would be dismantled and removed, and the second new boiler would be constructed. The third new boiler would also be constructed at that time or later, in phase 3.

## **III. PROJECT EMISSIONS**

The potential emissions from the new boilers are listed below. The potential emissions reflect the maximum emission rates and operation of the new boilers that would be allowed by the draft permit. The actual emissions of the boilers will be less than these potential emissions. In particular, the new boilers would not normally operate at their maximum capacity. The actual emissions of the boilers will also be lower to the extent that they operate with a reasonable margin of compliance from permitted emission rates.

Potential Emissions of the New Boilers (Tons Per Year)	
Pollutant	Emissions
Nitrogen Oxides (NO <sub>x</sub> )	82.7
Carbon Monoxide (CO)	82.8
Particulate Matter <sup>1</sup> (PM)	4.1
Particulate Matter <sub>10</sub> <sup>1</sup> (PM <sub>10</sub> )	5.1
Particulate Matter <sub>2.5</sub> <sup>1</sup> (PM <sub>2.5</sub> )	5.1
Volatile Organic Material (VOM)	10.3
Sulfur Dioxide (SO <sub>2</sub> )	5.5

<sup>1</sup>PM only includes filterable particulate; PM<sub>10</sub> and PM<sub>2.5</sub> include both filterable and condensable particulate.

Champaign County is an attainment area for all pollutants. As such, the applicability of the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21, must be considered for this proposed project. Because UIUC is an existing major source for purposes of PSD, this project must be reviewed to see whether it is a major modification for any regulated NSR pollutants under the PSD rules. For pollutants regulated under the PSD rules, other than greenhouse gases (GHG), the “net increases” or “increases” in emissions are below the respective PSD significant emission rates under the PSD rules, 40 CFR 52.21(b)(23)(i). Because increases or net increases in emissions of regulated pollutants other than GHG are not significant, GHG are not considered for applicability of PSD.

For emissions of NO<sub>x</sub> from these boilers, as summarized in the table below, UIUC evaluated the net increases in emissions with this project to show that the project would not result in a significant net increase in NO<sub>x</sub> emissions. Thus, this project is not a major modification for NO<sub>x</sub> under the PSD rules. This “netting analysis” was conducted by UIUC because the potential NO<sub>x</sub> emissions of the proposed boilers are more than 40 tons/year, the relevant significant emission rate under the PSD rules. This netting analysis considered the decreases in actual NO<sub>x</sub> emissions that will be contemporaneous with this project from the permanent shutdown of the three existing natural gas and oil fired boilers at the Abbott Power Plant.<sup>1</sup> Considering these decreases in emissions, this project will not result in significant net increases in emissions of NO<sub>x</sub>. This is what one would reasonably expect since the primary fuel of these boilers is natural gas, the new boilers will have modern burner systems and the heat input capacity of the new boilers will be less than the total capacity of the existing boilers.

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<sup>1</sup> Three existing natural gas-fired boilers will be removed from service at the same time that the proposed boilers are to be constructed. Aside from the requirement to avoid PSD applicability, the existing boilers must physically be dismantled before installation of the new boilers because the new boilers will occupy the same physical location as the existing boilers. The decreases in emissions that will result from the permanent shutdown of these existing boilers were determined as the “baseline emissions” of these boilers, that is, the average actual annual emissions of these boilers during the 24-month period from January 2004 through December 2006, during which period all these boilers operated.

Net Changes in Emissions of NO <sub>x</sub> (tons/year) <sup>2</sup>					
Pollutant	Project Emissions	Contemporaneous Changes in Emissions		Net Increase	Significant Emission Rate
		Decreases	Increases		
NO <sub>x</sub>	82.7	43.3	---	39.4	40

The potential emissions of other regulated NSR pollutants from this project, including emissions of CO, PM, PM<sub>10</sub>, PM<sub>2.5</sub>, VOM and SO<sub>2</sub> are all below the applicable significant emission rates in the PSD rules. For example, the potential SO<sub>2</sub> emissions of the new boilers are only 5.5 tons/year, which is less than the applicable significant emission rate, 40 tons/year. As such, this project is not a major modification for any of these other pollutants.

#### IV. APPLICABLE EMISSION STANDARDS

UIUC's application for the proposed project shows that the new boilers will comply with applicable federal and state emission standards, including applicable federal emission standards adopted by the USEPA (40 CFR Parts 60 and 63) and the emission standards of the State of Illinois (35 Ill. Adm. Code: Subtitle B, Subchapter c).

The boilers will be designed to comply with requirements of the federal New Source Performance Standards (NSPS) for Industrial-Commercial-Institutional Steam Generating Units, 40 CFR 60 Subpart Db. In addition, the new boilers would also be designed to comply with the applicable requirements of the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources, 40 CFR 63 Subpart JJJJJ. The Illinois EPA administers the NESHAP in Illinois on behalf of the EPA under a delegation agreement.

#### V. DRAFT PERMIT

The Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the new boilers. The conditions of the permit set forth the emission limits and the air pollution control requirements that the boilers must meet. These requirements include the applicable emission standards that apply to the boilers. They also include the measures that must be used and the emission limits that must be met for emissions of different regulated pollutants from the boilers.

In addition to annual limits on emissions, the permit includes short-term emission limits and operational limits, as needed to provide practical enforceability of the annual emission limits.

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<sup>2</sup> Emissions of PM, PM<sub>10</sub>, PM<sub>2.5</sub>, VOM, SO<sub>2</sub> and CO are not addressed in the netting analysis. This is because the emissions of these pollutants from the proposed project are below their respective significant emission rates under the PSD rules, i.e., 25, 15, 10, 40, 40 and 100 tons/year, for PM, PM<sub>10</sub>, PM<sub>2.5</sub>, VOM, SO<sub>2</sub> and CO.

The permit would also establish appropriate compliance procedures for the project, including requirements for fuel certification upon delivery (i.e., sulfur content of fuel to the boilers), emission testing, required work practices, operational monitoring (e.g., fuel usage), recordkeeping, and reporting. These measures are imposed to assure that the operation and emissions of the facility are appropriately tracked to confirm compliance with the various limits and requirements established for individual units.

## **VI. REQUEST FOR COMMENTS**

It is the Illinois EPA's preliminary determination that the application for the proposed boilers meets applicable state and federal air pollution control requirements, subject to the conditions in the draft permit. The Illinois EPA is therefore proposing to issue a construction permit for the boilers.

Comments are requested on this proposed action by the Illinois EPA and the conditions of the draft permit.